

Supporting information for

Reversibly-crosslinked Thermo- and Redox-responsive Nanogels for Controlled Drug Release

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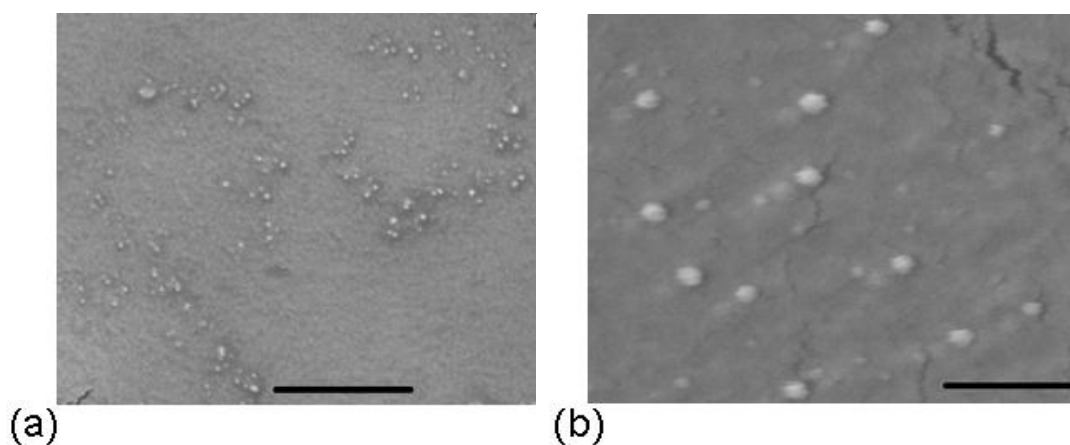


Figure S1. SEM image of the PVOH-*b*-PNVCL crosslinked nanogels AM01 (a, scale bar: 2000 nm) and amplified image (b, scale bar: 500 nm)

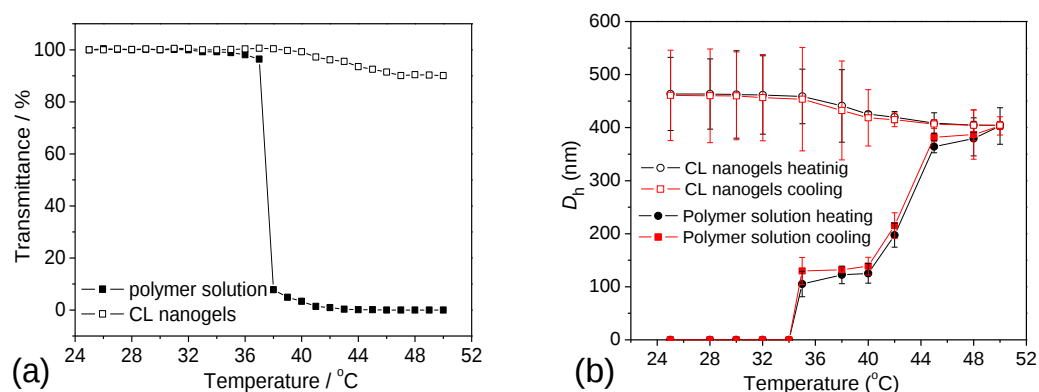


Figure S2. Dependence of transmittance at 700 nm on temperature for the $\text{PVOH}_{226}\text{-}b\text{-PNVCL}_{494}$ polymer aqueous solution (solid, 0.05 wt.%) and crosslinked (CL) nanogels AM02 aqueous solution (open, 0.05 wt.%) (a); plotting of D_h and PDI as a function of temperature for the $\text{PVOH}_{226}\text{-}b\text{-PNVCL}_{494}$ polymer aqueous solution (solid, 0.05 wt.%) and crosslinked (CL) nanogels AM02 aqueous solution (open, 0.05 wt.%). The solid lines just serve as eye guidance.

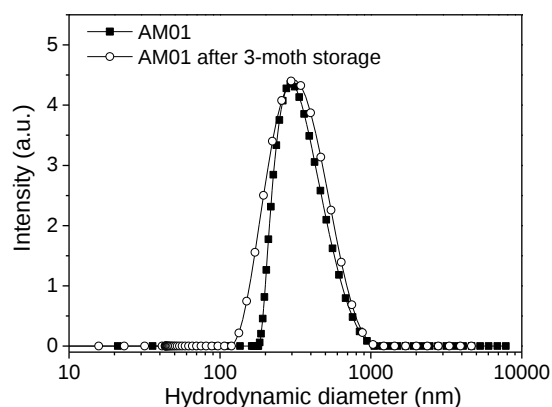


Figure S3. Size distribution diagrams (25°C) of the fresh-prepared $\text{PVOH-}b\text{-PNVCL}$ crosslinked nanogels AM01 aqueous solution (0.05 wt.%), and crosslinked nanogels AM01 aqueous solution (0.05 wt.%) after 3-month storage at 25°C

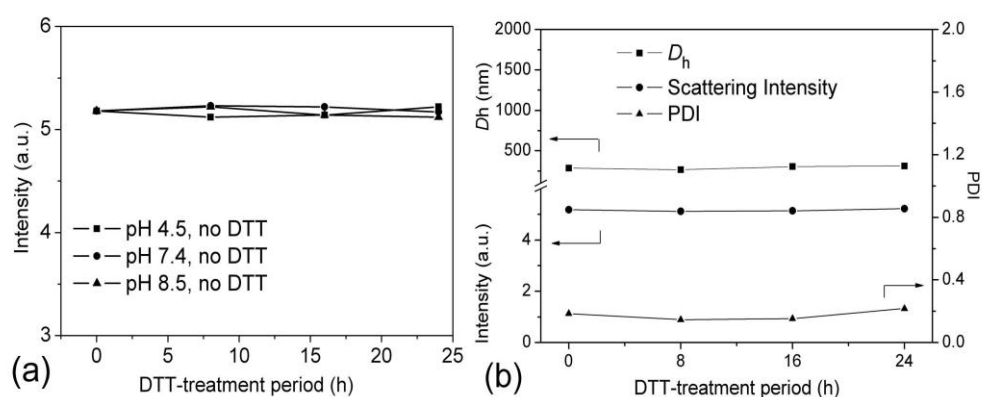


Figure S4. Evolution of scattering intensity of the PVOH-*b*-PNVCL crosslinked nanogels AM01 aqueous solution (0.05 wt.%) at different pH in the absence of DTT at 37°C (a); and plotting of scattering intensity, D_h and PDI of the PVOH-*b*-PNVCL crosslinked nanogels AM01 vs. treatment period (pH 8.5) in the absence of 10-mM DTT. The solid lines just serve as eye guidance.

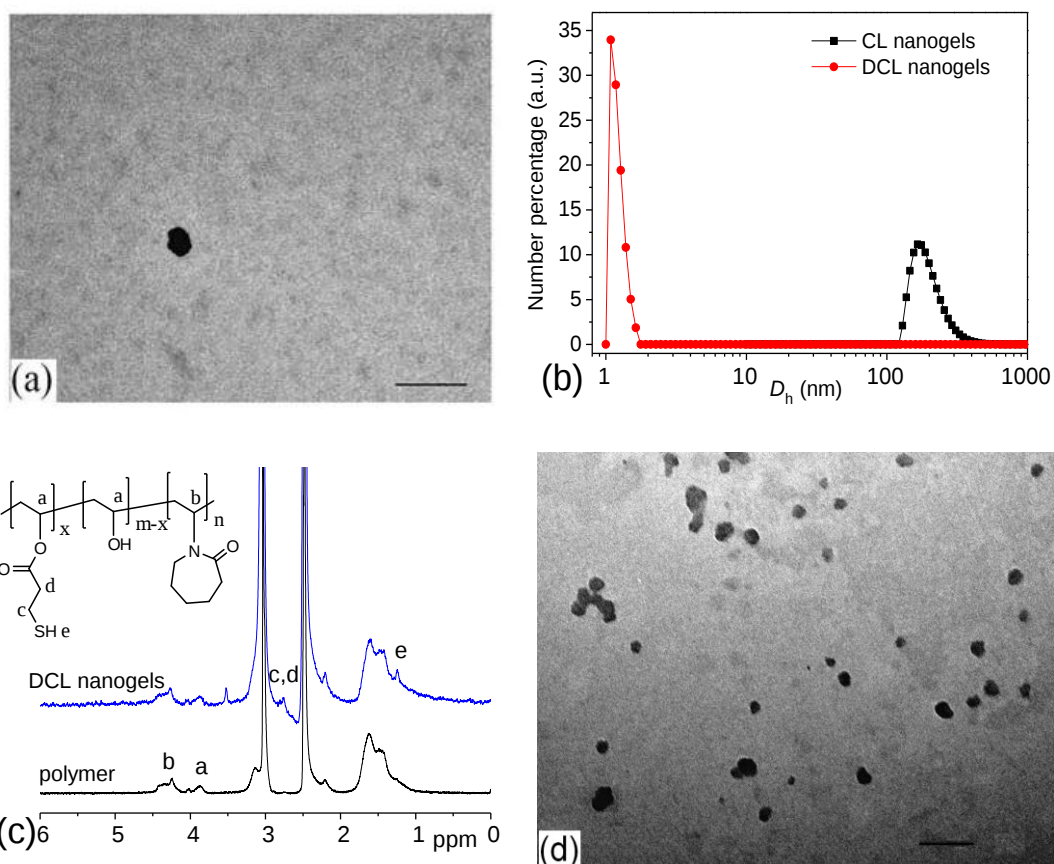


Figure S5. TEM image of the de-crosslinked nanogels (a, scale bar: 1 μ m), number-averaged size

distribution of crosslinked nanogels AM01 and RCL nanogels (b, 0.05 wt.%), ^1H NMR spectra of the parent PVOH-*b*-PNVCL copolymer and the DCL nanogels (c, $\text{DMSO-}d_6$, 353 K), and TEM image of the re-crosslinked nanogels (d, scale bar: 500 nm)

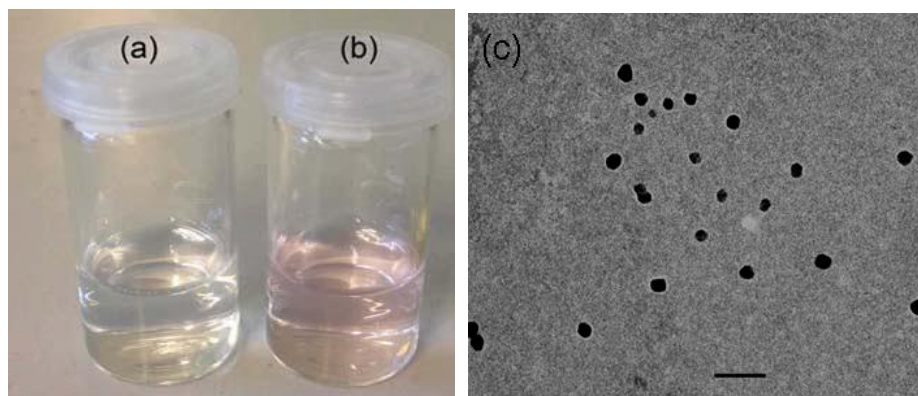


Figure S6. Pictures of PVOH-*b*-PNVCL crosslinked nanogels AM01 without (a) or with NR loaded (b), and representative TEM image of the NR-loaded crosslinked nanogels AM01 (c, scale bar: 200 nm)

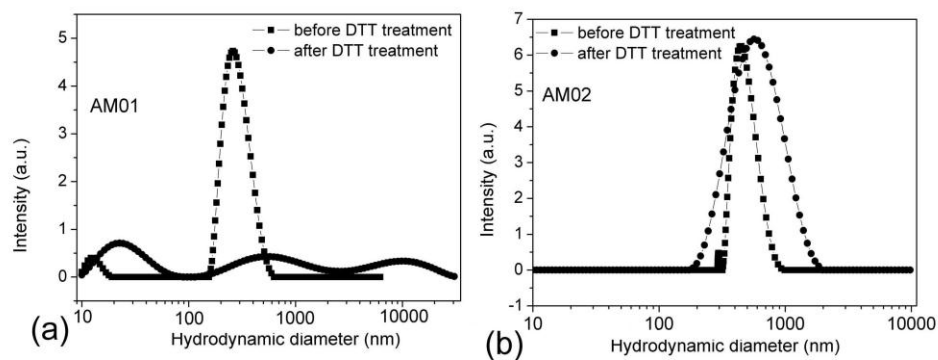


Figure S7. DLS profiles of the NR-loaded crosslinked nanogels before and after 24-h DTT (10 mM) treatment at pH 8.5 for AM01 (a) and AM02 (b)

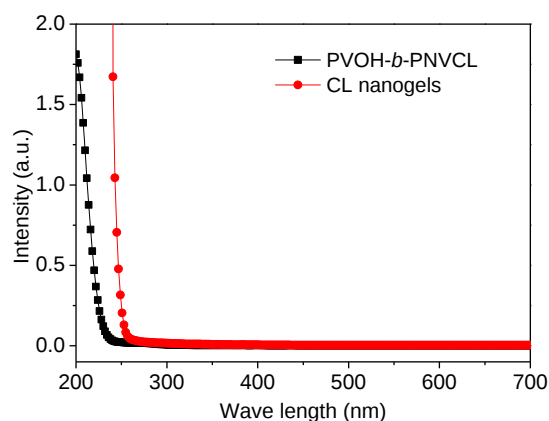


Figure S8. UV/vis spectra of the PVOH-*b*-PNVCL copolymer and the corresponding nanogels AM01 solution (0.1 wt. %)

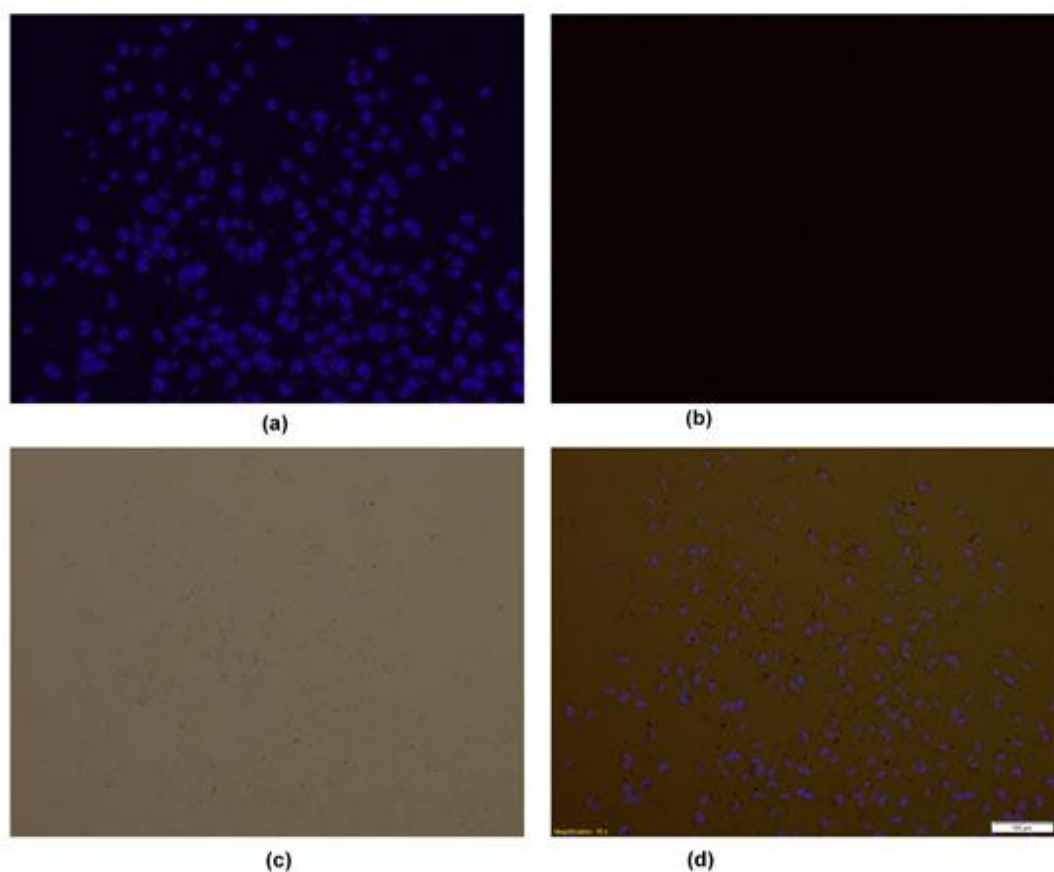


Figure S9. Fluorescence microscopic images of non-treated MEL-5 cells: (a) cell nuclei stained with DAPI (blue), (b) fluorescence pattern of NR (*Ex*: 485 nm, *Em*: 595 nm), (c) phase contrast pattern, and (d) merged image of (a), (b) and (c); scale bar: 100 μ m.